THE EFFECT OF ROOT REINFORCEMENT AS AN INDICATOR IN SOIL SUSCEPTIBILITY MAPPING IN MOUNTAIN ECOSYSTEMS

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Extreme rainfall events in alpine regions have become more and more frequent due to climate change which has greatly exacerbated soil degradation.
Frequently occurring severe erosion processes, shallow landslides and debris flows necessitate the development of susceptibility maps for early warning systems and civilian protection. Vegetation cover is of major importance for soil protection and its presence on mountain slopes is essential in reducing soil loss. Plant roots are particularly important as they provide additional cohesion to the soil and root permeated soils are much better at withstanding soil erosion processes.
This study would investigate root characteristics and how root systems contribute to reducing soil loss in mountainous regions applying bio-mechanical testing on roots to quantify root reinforcement with the aim to improve the accuracy of existing susceptibility maps on natural hazards and risk assessment for early warning systems and civilian protection. The research would involve the study of the root traits and morphology of numerous Alpine plant species from different land types (agricultural land, pasture, ski slope, forest and moraine).
It would involve the prediction of soil loss and runoff by means of a soil erosion model, and modification of the Atterberg limits and the aggregate stability indicators according to the studied root reinforcement data.
The results would expand and add to knowledge on the biomechanical characteristics of previously unstudied Alpine plant species. As well as providing improved susceptibility maps of mountainous areas of the Aosta Valley and Piemonte regions in the NW Italian Alps.

Parole chiave*:* soil stabilization, alpine vegetation, root traits, root morphology, susceptibility mapping